



Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime

Sean Carroll

Download now

Read Online ➞

Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime

Sean Carroll

Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime Sean Carroll

As you read these words, copies of you are being created.

Sean Carroll, theoretical physicist and one of this world's most celebrated writers on science, rewrites the history of 20th century physics. Already hailed as a masterpiece, *Something Deeply Hidden* shows for the first time that facing up to the essential puzzle of quantum mechanics utterly transforms how we think about space and time. His reconciling of quantum mechanics with Einstein's theory of relativity changes, well, everything.

Most physicists haven't even recognized the uncomfortable truth: physics has been in crisis since 1927. Quantum mechanics has always had obvious gaps—which have come to be simply ignored. Science popularizers keep telling us how weird it is, how impossible it is to understand. Academics discourage students from working on the "dead end" of quantum foundations. Putting his professional reputation on the line with this audacious yet entirely reasonable book, Carroll says that the crisis can now come to an end. We just have to accept that there is more than one of us in the universe. There are many, many Sean Carrolls. Many of every one of us.

Copies of you are generated thousands of times per second. The Many Worlds Theory of quantum behavior says that every time there is a quantum event, a world splits off with everything in it the same, except in that other world the quantum event didn't happen. Step-by-step in Carroll's uniquely lucid way, he tackles the major objections to this otherworldly revelation until his case is inescapably established.

Rarely does a book so fully reorganize how we think about our place in the universe. We are on the threshold of a new understanding—of where we are in the cosmos, and what we are made of.

Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime Details

Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime

400 pages , Published September 10th 2019 by Dutton

 [Download Something Deeply Hidden: Quantum Worlds and the Emergen ...pdf](#)

 [Read Online Something Deeply Hidden: Quantum Worlds and the Emerg ...pdf](#)

Download and Read Free Online Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime Sean Carroll

Manuel Antão says

If you're into stuff like this, you can read the full review.

Pascal's Triangle: "Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime" by Sean Carroll

“When a spin is measured, the wave function branches via decoherence [according to the MWI], a single world splits into two and there are now two people where used to be just one. It makes no sense to ask which one is ‘really me.’ Likewise, before the branching happens, it makes no sense to wonder which branch ‘I’ will end up in. Both of them have every right to think of themselves as ‘me.’ [...] The world duplicates, and everything within the world goes along with it.”

In “Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime” by Sean Carroll

“Many-Worlds is the most falsifiable theory ever invented.”

In “Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime” by Sean Carroll

Let me get this out of the way first. Let me put forth the main 4 “interpretations”...

Continues elsewhere.

BlackOxford says

Scientific Revelation

There is more than a hint of theological method in modern physics. Carroll confirms this in his insistence that quantum physics is, in his words, not an ‘epistemic’ but an ‘ontological’ discipline His claim is that current quantum theory is a description of the way the world really is not merely a way of understanding the world. This is the traditional position of theologians who would like us all to consider God as the ultimate reality even if we find this reality to be not what we perceive it to be.

In fact Carroll defines science in general, not just physics, in theological terms. For him, the essential presumption of science is the intelligibility of the universe. This implies not just that there is a pre-existing order to be discovered but also that such order in some sense wants itself to be discovered. These implications are precisely those of what is called fundamental theology, the study of how God can be known about at all.*

The similarity between Carroll’s view of quantum physics and fundamental theology is important because in both there is no distinction possible between epistemology and ontology. How we know about the world, or

God, is indistinguishable from what the world, or God, actually is. Theology has a term for referring to this knowledge of being (or Being) - revelation. Essentially, you either get revelation or you don't. It can't be argued about because the presuppositions about what constitute both existence and knowledge about existence are contained simultaneously within it.

Thomas Aquinas is perhaps the most well-known theologian to defend the presuppositions of revelation. In doing so, his preferred approach is cosmological, that is, treating the entire universe as an entity to be explained in terms of its existence and its history. At such a level of analysis, ordinary logic (like that of cause and effect and their priority in time) start to break down. Thus, Aquinas asks, if every effect must have a cause, what is the ultimate cause? And if human beings exhibit free will and purpose as an effect of that ultimate cause, is it not reasonable to attribute will and purpose to that cause. QED, the universe is a consequence of divine action with some divine purpose toward which it is drawn.

Carroll makes a parallel case for quantum physics and the Many-Worlds theory of Hugh Everett, formulated in the 1950's. First, just like Aquinas, he adopts a cosmological position. The universe, he says, is one vast quantum state, a wave function of enormous complexity. This is not inconsistent with the theory of quantum physics even if it could never be empirically verified. And it fits with the strange results of quantum experimentation. QED, reality is composed of an indeterminate number of simultaneous universes. In other words, Everett's theory qualifies as a revelation.

If this is the case, then this wave function will evolve according to the mathematics of the Schrödinger equations, just as it has always done. Not according to the logic of Newtonian (or Aristotelian) cause and effect but the logic of probability and entanglement. This wave function is not something temporary or local that might transform into something else, say a particle, or 'collapse' upon observation. Within it is not only the universe we know about but an infinite number of others that exist simultaneously.

The wave function, in other words, is the very stuff, the ultimate reality of the universe; and it doesn't make distinctions between observer and observed or between possible and actual. Our brains and the farthest galaxies as well as everything in between, including any number of other worlds, must be part of this wave function, since there can be nothing else. So the conventional 'Copenhagen interpretation,' despite its usefulness, is wrong. The wave function is the Alpha and the Omega, the source and giver of not just life but also existence, the Ground of Being (as modern theologians like to say). If it explicitly isn't called godly, it's only because the divine has suffered a significant reduction in brand-value in recent centuries.

That all sounds logically fine, if more than a tad baroque. But the reason it all sounds fine is the same reason that Aquinas sounds fine to the Pope. Once ontology and epistemology are conflated, that is, when that which is is presumed to confirm that which we know, we have entered the realm of religion. At that point, we simply assume a cosmological guarantor in what we take as revelation. Revelation is its own assurance; it proves itself. And at that point Aquinas is about as credible as Carroll

* The most important Christian theologian of the 20th century, Karl Barth, devoted himself almost exclusively to this issue. The intellectual machinations he had to employ in order to establish the intelligibility of God are really important for scientists like Carroll to consider before casually presuming an even more diffuse source of such an attribute.

Postscript 16Sep19. Another view: <https://www.sciencefocus.com/science/...>

David says

This book is about the "Many-Worlds" hypothesis of quantum mechanics. It is a deep description of the hypothesis, and its context in quantum mechanics. Quantum mechanics does not violate logic; its precise

predictions are correct, and among the most accurate of any scientific theory. But its foundations are still quite controversial, especially when it comes to understanding the role of gravitation.

The Many-Worlds hypothesis is a simple way to explain some of the seeming paradoxes of quantum mechanics. There are alternative hypotheses, and the book covers these as well.

I can't say that I learned anything (I am a physicist), but the book did focus my attention on a few key ideas. First, it is incorrect to say that atoms are made up mostly of empty space; particles are not tiny points, but are wave functions that are spread out in space.

Another example: The Heisenberg Uncertainty Principle does *not* say that the act of measuring a quantity disturbs the system. In addition it does *not* say that you cannot simultaneously measure position and momentum perfectly at the same time. Instead, it says that a definite position and momentum (velocity) do not even exist simultaneously. The wave function solution to the Schrodinger Equation acts as a wave, and so it can be analyzed like a Fourier Transform. Think of a sudden audible transient--like a click. The click occurs at a definite point in time, but it has no specific pitch because its spectrum is broadband. Likewise, a pure audible tone must occur over a span of time; it does not occur at a specific, definite time.

Here's the problem with the book. Like many technical books that are aimed at non-specialists, it gets deep into jargon and concepts that are totally unfamiliar. The non-specialist can understand all the words, and maybe even entire sentences. But it comes off sounding like a foreign language. And, there is an additional problem with this book. Much of the book focuses on the Schrodinger Equation, which is a typical type of partial differential equation. But unless you have studied similar equations, you cannot *really* understand the physical concepts described in this book. A general form of the equation is written in the book, but it is so simplified, that to a mathematician it doesn't convey much of anything, and to a non-mathematician it is gibberish.

This book is an excellent attempt at explaining some of the deepest mysteries of quantum mechanics. But the fundamentals are not covered well enough for a general reader to grasp all the arguments presented here.

From Reader Review Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime for online ebook

From reader reviews:

Patricia Clay:

The experience that you get from Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime will be the more deep you digging the information that hide inside the words the more you get interested in reading it. It does not mean that this book is hard to comprehend but Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime giving you thrill feeling of reading. The article author conveys their point in a number of way that can be understood simply by anyone who read this because the author of this guide is well-known enough. This specific book also makes your personal vocabulary increase well. Therefore it is easy to understand then can go together with you, both in printed or e-book style are available. We suggest you for having this Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime instantly.

Shad Broussard:

Information is provisions for folks to get better life, information currently can get by anyone in everywhere. The information can be a understanding or any news even a problem. What people must be consider if those information which is inside the former life are challenging be find than now's taking seriously which one is suitable to believe or which one often the resource are convinced. If you get the unstable resource then you have it as your main information there will be huge disadvantage for you. All of those possibilities will not happen throughout you if you take Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime as your daily resource information.

Carlos McNerney:

Beside this particular Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime in your phone, it could give you a way to get more close to the new knowledge or facts. The information and the knowledge you will got here is fresh from your oven so don't always be worry if you feel like an outdated people live in narrow commune. It is good thing to have Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime because this book offers for your requirements readable information. Do you at times have book but you seldom get what it's facts concerning. Oh come on, that wil happen if you have this with your hand. The Enjoyable agreement here cannot be questionable, such as treasuring beautiful island. So do you still want to miss it? Find this book in addition to read it from right now!

Lisa Thomason:

Don't be worry should you be afraid that this book may filled the space in your house, you will get it in e-book means, more simple and reachable. This kind of Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime can give you a lot of buddies because by you looking at this one book you have matter that they don't and make you more like an interesting person. This specific book can be one of one step for you to get success. This e-book offer you information that probably your friend doesn't learn, by knowing more than other make you to be great individuals. So , why hesitate? We need to have Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime.

**[BOOK]? Something Deeply Hidden: Quantum Worlds and the Emergence of Spacetime Sean Carroll
UGC9QAO8FHK**